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THE BRITISH ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.*

ON September 7th the British Association met in Bristol for the third time since its foundation. It met there very early in its career—in 1836—when the Marquis of Lansdowne was President. Among the distinguished men of the period who were present in an official capacity were Whewell, Buckland and Henslow, and the total attendance was 1,350. The Association met again at Bristol about forty years later—in 1875—when the Presidential chair was occupied by the eminent engineer, Sir John Hawkshaw. Many distinguished scientific men were present, the total attendance being 1,951. There were registered early in the week for the present meeting 2,284 members and associates. The Bristol authorities and the local officials did everything in their power to render the meeting at least a social success. Besides the usual *conversazione*, there were one or more garden parties, and visits to places of interest in the city and neighborhood every day, not to mention private dinner parties. On Friday evening, September 9th, there was a symposium in the Merchant Venturers' Technical College. On Saturday, September 10th, there was a public banquet arranged by the President and members of the Bristol Chamber of Commerce. On Tuesday, September 13th, there was another banquet given by the Master and Society of Merchant Venturers. A Biological Exhibition was held in the Zoological Gardens, the opening ceremony being performed by Sir John Lubbock on the afternoon of the 8th. Some two dozen manufactories, works, etc., were open to the inspection of members, besides a variety of institutions and places of interest. Eight excursions were arranged for Saturday, the 10th, and other eight for Thursday, the

15th. At the end of the meeting, September 16th to 20th, there was a five days' excursion to Exeter, Torquay, Plymouth and Dartmoor.

The President of the Association, Sir William Crookes, in his address* dealt with the subject of the Supply of Wheat to the United Kingdom and then to the whole civilized world. He discussed methods of fixing atmospheric nitrogen and converting it into valuable manure. He then proceeded to deal with more purely scientific subjects—the liquefaction of hydrogen, the constitution of matter at absolute zero, the newly discovered gaseous elements, the Zeeman phenomenon, Röntgen ray discoveries, practical and theoretical, cathode rays and the fourth state of matter, Uranium and Polonium rays, unsuspected sources of energy, spectroscopy, and a new element—and ended with a discussion of psychical research.

Section A (Mathematics and Physics) was presided over by the distinguished physicist Professor W. E. Ayrton, F.R.S., whose ingenious inventions and applications are well known. His address was largely concerned with the diffusion of smells. On Thursday, the 8th, the International Conference on Terrestrial Magnetism and Atmospheric Electricity assembled and Professor Rücker delivered an address. The meeting of this conference will be regarded as part of Section A, but separate sittings were held each day. Saturday's sittings were devoted to mathematics and meteorology, and papers on experimental electricity were taken on Tuesday. A joint meeting of Sections A and B (Chemistry) for the discussion of results of the recent solar eclipse expedition was held on Monday.

The President of Section B (Chemistry) was Professor F. R. Japp, of Aberdeen Uni-

* Based on articles in the London *Times*.

* This address will be published in *SCIENCE* as soon as space permits.—ED.

versity. The subject of his address was 'Stereochemistry and Vitalism.' He discussed Pasteur's researches in molecular asymmetry, aimed to demonstrate the correctness of his belief now generally questioned by chemists, that life is necessary for the production of optically active organic compounds. Professor Japp deduced from Pasteur's results the inadequacy of any interpretation of the phenomena of life which is based solely on the mechanics of atoms. In the general sectional proceedings Professor Ramsay and Dr. Morris Travers gave an account of their recent discoveries, especially in reference to 'Neon,' one of the three new constituents of the atmosphere, and Professor Sidney Young reviewed his physico-chemical investigations under the title of 'Some Researches on the Thermal Properties of Gases and Liquids.' Among points of more general interest included in the paper was the fractional distillation of liquids and an extended study of the subject in relation to the separation of pure hydrocarbons from American petroleum. Dr. W. J. Russell gave an account of his work on the action of certain peculiar and special radiations from metallic surfaces upon photographic plates. Bristol offered special attractions to chemists on account of the interesting chemical works in its neighborhood.

Section C (Geology) was presided over by Mr. W. H. Huddleston, F.R.S. His address dealt mainly with certain points in the geology of the Southwest of England, east of Dartmoor. Special attention was directed to the survey map on the scale of four miles to an inch, which has lately been issued. The principal alterations were briefly discussed. Accepting Bath as a center with a radius of about fifty miles, attention was drawn to the great variety of geological formations within that area—a variety not to be matched elsewhere in an equal space. Some of the results of recent observations

were recorded, and certain peculiarities, long known in connection with the district, noticed—for instance, the passage of the old red sandstone into the Devonian, and, again, of the Carboniferous limestone into part of the culm-measures. Even in Mesozoic times the contrast presented by the inferior oolite of Dundry to that of the Cotswolds has given rise to much discussion. In tectonic geology, likewise, the Gloucestershire coalfield exhibits a remarkable change in the strike of the beds, indicating that two distinct systems of movement must have been at work within that area. The possible evidences of glacial action in the Cotswolds was discussed, and brief mention was made of the more recent changes which are known to have taken place in the estuary of the Severn.

Among the papers promised for this Section were the following: Professor Hull, F.R.S., 'On the Sub-Oceanic Physical Features of the North Atlantic;' Mr. A. Strahan, 'On the Revision of the South Wales Coalfield by the Geological Survey;' Mr. E. B. Wethered, 'On the Building of the Clifton Rocks;' Mr. S. S. Buckman, 'On the so-called Midford Sands;' Mr. H. B. Woodward, F.R.S., 'On Arborescent Markings in Carboniferous Limestone;' Professor Lloyd-Morgan, 'Some Notes on Local Geology,' and the Rev. G. C. H. Pollen, 'On the Further Exploration of the Newydd Caves, North Wales.' Professor Hull's paper brought forward additional evidence in favor of the author's well-known views on Continental elevations. Professor Lloyd-Morgan's paper on the local geology was an invaluable introduction to the excursions. The long excursion to Exeter and Dartmoor at the close of the meeting was also one of special interest for geologists.

Professor W. F. R. Weldon, F.R.S., presided over Section D (Zoology and Physiology). In his address he urged the necessity of a statistical treatment of the problems

arising in connection with variation, inheritance and selective destruction among animals, and spoke of the results already obtained in this direction (especially by Mr. Francis Galton and Professor Karl Pearson in the treatment of variation and inheritance. This aspect of zoological problems received a good deal of attention at Bristol. Dr. Galton and Professor Poulton read papers which bear upon it.

The President of Section E (Geography) was Colonel George Earl Church, and the subject of his address was 'Argentine Geography and the Ancient Pampean Sea.' He aimed to show that the Plata drainage area was in a recent geological period much more extensive than it is to-day; that its most northern limit was $10^{\circ} 44'$ south latitude, and that nearly the entire waters which now unite to form the Madeira river, the main affluent of the Amazon, once flowed southward into a Pampean Sea, which penetrated 1,400 miles inland, north to almost 19° south latitude. Incidentally Colonel Church dealt with various topics of interest in connection with the past and present hydrography and physical geography of South America. Among other points he maintained that a great ancient lake (115,000 square miles) was formed in the valley of the Beni and Mojos after the latter was cut off from its southern connection with the Pampean Sea. The sensation in this Section was the account which M. de Rougemont gave of his 30 years' residence among the savages of central Australia.

The President of Section F (Economical Science and Statistics), Dr. J. Bonar, in his address dealt with 'Old Lights and New in Economic Study;' according to the program, Mr. G. E. Davies, of Bristol, was expected to read a paper on 'Sugar in Bristol;' Mr. J. O. Galloway, of Manchester, on 'Shipping Rings and Corners;' Mr. A. L. Bowley on 'Wages;' Professor A. W. Flux on

'Saving and Spending;' Miss Clara Collet on 'Expenditure of Middle Class Working Women;' Mr. H. H. Vivian on 'Labor Copartnership;' Mr. L. L. Price on 'The Bimetallic Ratio;' Mr. C. S. Loch on 'Poor Law;' Mr. E. Cannon on 'Municipal Enterprise;' and Mr. G. Pearson on 'Electrical Enterprise and Municipalities.'

Section G (Mechanical Science) was presided over by Sir John Wolfe-Barry, K.C.B., F.R.S., who in his address touched upon the growth of British shipping and the recent and future demands for dock accommodation throughout the kingdom, with some reference to the city of Bristol in this connection. He also adverted to the necessity of further facilities for experimental research and to the work of the committee which has recently been sitting, on the nomination of government, in order to inquire into and report on the establishment of a national physical laboratory. In the general proceedings of the Section there were one or two interesting discussions.

The President of Section H (Anthropology) was Mr. E. W. Brabrook, C.B., and the main subject of his address was the unity of the anthropological sciences. In the treatment continuity is assumed, and Mr. Brabrook gave a practical turn to anthropology by suggesting an ethnographical survey of the Empire. The President's address was followed by a number of papers on folk-lore and comparative mythology.

Section I (Physiology) was combined with Section D (Zoology). Section K (Botany) was presided over by Professor F. O. Bower, F.R.S., the subject of whose address was the homology of the members of the plant body at large, but with special reference to that question of homology involved in the alternation of generations in green plants. The position arrived at was that the facts, such as those relating to recently-discovered anomalies, are in accord with a theory of antithetic alternation. In the sectional

proceedings there was a discussion on 'Alternation of Generations,' opened by Dr. Lang, of Glasgow University. Dr. F. F. Blackman, of Cambridge, gave a lecture of a semi-popular character on the 'Lungs of Plants.'

The Friday evening lecture was by Professor Sollas, F.R.S., on 'Funafuti—the Study of a Coral Island,' and the Monday evening lecture by Mr. Herbert Jackson on 'Phosphorescence.' The lecture to workmen on Saturday evening was by Professor Poulton, F.R.S., on the 'Ways in which Animals Warn their Enemies and Signal to their Friends.'

The report of the Council of the Association to the General Committee nominated Professor Rücker as trustee in the room of the late Lord Playfair, the other trustees being Lord Rayleigh and Sir John Lubbock. The establishment of experimental agricultural stations, of a hydrographic survey of Canada, the adoption of civil reckoning for astronomical purposes and the establishment of a Bureau of Ethnology under the auspices of the British Museum were reported upon.

In accordance with the regulations, the retiring members of the Council are Professor Edgeworth, Mr. Victor Horsley, Mr. G. J. Symons and Professor W. Ramsay. The Council recommend the re-election of the other ordinary members of the Council, with the addition of Dr. W. H. Gaskell, F.R.S.; Dr. J. Scott Keltie; Major P. A. MacMahon, F.R.S.; Mr. L. L. Price and Professor W. A. Tilden, F.R.S. An invitation to hold the annual meeting of the Association in the year 1900 at Bradford, and an invitation from Cork for a future meeting, were received.

Professor Rücker, the General Treasurer, showed in his report for 1897–98 that the receipts amounted to £4,623 and the expenditures to £2,920, leaving in hand a balance of £1,703. The investments amounted to £11,137.

NOTES ON INORGANIC CHEMISTRY.

Two years ago Moissan described a carbide of tungsten of the formula W_2C , prepared by heating the metal or its oxide with excess of carbon in the electric furnace. In a recent *Comptes Rendus* P. Williams describes a new carbide of tungsten which has the formula WC . It is formed by heating a mixture of tungstic acid and carbon with iron in an electric furnace or even by means of a powerful forge. The carbide differs from that of Moissan by being unattacked by chlorine even at a red heat. It is harder than quartz and is extremely difficult to decompose, water and hydrochloric acid having no effect upon it at high temperatures; it is little affected by other acids. In these respects it differs very materially from most of the known carbides.

To the last *Zeitschrift für anorganische Chemie* A. Piccini contributes a study of the alums of titanium, formed by reduction of titanous acid by the electric current in the presence of sulfuric acid and an alkaline sulfate. Piccini calls particular attention to the advantage of using cesium and rubidium salts in forming alums difficult to crystallize, owing to the comparative insolubility of cesium and rubidium alums. A very similar study was carried out at Washington and Lee University last year by Mr. E. A. O'Neal, and an account of it presented by me to the Chemical Section of the American Association at the Boston meeting. The conclusions reached were like those of Piccini. The cesium and rubidium alums of iron and cobalt were described in our paper.

As an appendix to his paper Piccini describes the cesium manganese alum formed electrolytically. Potassium and ammonium manganese alums were described by Mitscherlich. Repeated efforts have been made in the Washington and Lee Laboratory to form them according to Mitscherlich's description and in other ways, but without